

- 2a Ovary partly or wholly inferior, fruit opening by a circumscissile slit at the middle or near the top; flowers sessile or subsessile and subtended by a cluster (involucre) of leaves; stems usually with tufts of hairs or cilia at the nodes (stipules) *Portulaca*
- 2b Ovary superior, fruit opening irregularly; flowers borne on slender pedicels in an open panicle, not subtended by leaves; stems and leaves lacking stipules, glabrous
Talinum

LEWISIA Pursh

Herbs, perennial, aerial stem very short from a thick fleshy rootstock, rootstock simple or branched. Leaves mostly in a condensed basal cluster at the apex of the rootstock, simple and entire, somewhat succulent. Inflorescences racemose, paniculate or solitary and axillary, often subtended by leaflike bracts; flowers bisexual, radially symmetrical, sepals 2-8, persistent in fruit, petals 4-18, white to pink or red; stamens 5 to many; pistil 1, ovary superior, placenta basal and central, styles 3-8 and fused near the base. Fruit a thin-walled capsule, dehiscence circumscissile near the base and then splitting upward; seeds 6 to many, ovate to cochleate, smooth and lustrous.

A genus of 20 species of the southwestern mountains of the United States; one species extends southward on the tops of the highest mountains through Mexico to Guatemala and has recently been reported from the Chirripó páramo in Costa Rica. Species of this genus are often planted as ornamentals in rock gardens.

Lewisia megarhiza (Hemsl.) MacBryde, J. Scott. Rock Gard. Club 13:295. 1973. *Calandrinia megarhiza* Hemsley, Diagn. Pl. Nov. 23. 1879. *Oreobroma mexicanum* Rydberg, N. Amer. Fl. 21:326. 1932. *O. megarhiza* (Hemsl.) Standl. & Steyererm., Publ. Field Mus. Nat. Hist., Bot. Ser. 23:49. 1944.

Herbs, perennial, the short aerial stem and congested leafy internodes from the top of a single thick fleshy taproot to 10 cm long and 5-18 mm thick. Leaves all basal and congested at the apex of the taproot, simple and sessile; laminae 2-7 cm long, 1.2-3 mm broad, linear and entire, expanded near the base with thin sheathing margins, fleshy, glabrous. Flowers solitary on axillary pedicels 5-20 mm long, sepals 2, 6-7 mm long, petals 4-6, ca. 1 cm long, white. Fruit an ellipsoid capsule ca. 7 mm long and 4 mm thick, with very thin translucent walls; seeds numerous, 1.5 mm broad, cochleate, black, smooth and lustrous.

This species has been collected by Arthur Weston on Costa Rica's highest mountain, Chirripó Grande. All the specimens seen from Mexico and Guatemala were collected above 3,500 m elevation. The large taproot for so small a plant, the succulent linear leaves, the presence of only two sepals, and the distinctive fruit and seeds easily distinguish this species.

PORTULACA Linnaeus

By Donna Ford and William Burger

REFERENCE: C. Diego Legrand, Desmembración del género *Portulaca*, I and II, Comun. Bot. Mus. Hist. Nat. Montevideo vol. 3, no. 31:1-15, 1953 and no. 34:1-17, 1958.

Herbs, annual or perennial, often prostrate, stems succulent glabrous or puberulent; stipules often reduced to a ridge with conspicuous hairs. Leaves alternate, subopposite or crowded and pseudovercillate, simple and entire, sessile or petiolate, usually succulent and glabrous. Inflorescence of 1 to several flowers terminal on main and lateral stems, often subtended by closely crowded leaves forming an involucre; flowers bisexual and radially symmetrical, sessile or subsessile, perianth of 2 whorls, sepals 2, unequal and united near the base, petals 4-6, white, yellow or reddish, united only near the base, quickly with-

ering; stamens (4–6) 7 to many, borne on the base of the united corolla, filaments free; pistil solitary, ovary half-inferior to inferior, unilocular, ovules numerous on a basal placenta, styles 3–9 and united at the base. Fruit a circumscissile capsule, the top coming off as a single unit (calyptra), thin-walled; seeds usually numerous, cochleate to reniform, smooth to minutely tuberculate.

A genus of 150–200 species, distributed widely in tropical and subtropical regions. The small stature, succulent stems, brightly colored flowers subtended by an "involucre" of congested leaves, and calyptrate thin-walled fruit with cochleate seeds are distinctive. The genus is well represented in Mexico, and a number of species range southward to Guatemala and Honduras.

- 1a Leaves usually more than 4 mm wide, laminae flat; axillary hairs absent or inconspicuous (to 1 mm long)..... 2a
- 1b Leaves usually less than 4 mm wide, laminae often terete; axillary hairs present and conspicuous, 1–18 mm long..... 3a
 - 2a Ovary superior to half-inferior; capsule not winged, circumscissile at the middle or below, operculum hemispherical; seeds black, brown or blue-waxy; flowers yellow *P. oleracea*
 - 2b Ovary half-inferior to inferior; capsule with a circular wing, circumscissile at the middle or above, operculum flat or slightly rounded; seeds gray at maturity; flowers yellow to red *P. umbraticola*
- 3a Petals less than 1 cm long, pink to purple; stamens fewer than 40; small plants of open weedy sites *P. pilosa*
- 3b Petals more than 1 cm long and the flowers more than 2 cm broad, variously colored; stamens more than 40; cultivated ornamentals and not naturalized in Costa Rica; *P. grandiflora* Hooker.

Portulaca oleracea L., Sp. Pl. 445. 1753. *P. marginata* H.B.K., Nov. Gen. & Sp. 6:58. 1823. Figure 39.

Herbs, prostrate or ascending, often with many branches radiating from a single base, stems succulent and often becoming reddish, leafy internodes 0–5 cm long, 0.5–3 mm thick (dry), glabrous except at the nodes; stipules present in the form of a minute ridge with slender whitish hairs to 1 mm long (just below the leaf base). Leaves alternate to subopposite and opposite, often crowded together at the ends of branches; petioles 0.5–4 (8) mm long, expanded at the base with thin lateral margin; laminae 0.4–4 cm long, 0.3–2 cm broad, spatulate to obovate or obtriangular, bluntly rounded at the apex, tapering gradually to the cuneate base, margins entire and decurrent on the petiole, smooth and glabrous, succulent but drying dark and stiffly chartaceous, venation obscure. Flowers sessile at the ends of branches, solitary or clustered together, subtended by a cluster of leaves, hairs at the base of the flower inconspicuous, with a short floral cup (perianth tube), sepals 2, broadly ovate, 3–4.5 mm long, petals 4–6, 3–4.5 mm long, bright yellow; stamens 6–15, filaments ca. 1.6 mm long; style with 4–6 branches. Fruit ovoid, 4–8 mm long, 3–4 mm thick, circumscissile below the middle, distal cap 2–4 mm long; seeds 0.6–1 mm broad, cochleate, black, with granular or minutely tuberculate surface.

Plants of open sunny sites, often found along roadsides, on sand and gravel bars along streams, and in open weedy fields from sea level to 1,500 (2,000) m elevation on both the Caribbean and Pacific sides of Central America. The species appears to flower throughout the year, but is most commonly encountered from October to March. This species has become established all over the world, in both tropics and subtropics.

Portulaca oleracea is recognized by its small stature, numerous glabrous stems, succulent little leaves often crowded at the ends of stems and forming an involucre beneath the sessile yellow flowers, and the circumscissile fruit with basal placentation. The distal flowers on main stems and lateral stems with terminal flower clusters often form cymelike arrangements. These plants are called

Verdolaga in Central America ("Purselane" in English) and are often cooked as a vegetable.

***Portulaca pilosa* L., Sp. Pl. 445. 1753. Figure 41.**

Herbs, prostrate or erect, stems succulent, rarely exceeding 20 cm in length, leafy internodes 0–2 cm long; intrapetiolar stipule present, with tufts of whitish hairs 3–10 mm long from a band of tissue ca. 1.5 mm broad just above the leaf base. Leaves alternate or crowded together, sessile or with a short (1 mm) petiole; laminae 0.5–2 cm long, linear to narrowly lanceolate, acute at the apex, gradually narrowed at the base and decurrent on the petiole, margins entire, the laminae succulent (often terete) in life and glabrous, drying dark, venation obscure. Flowers sessile and crowded at the ends of stems, 2.5–3 mm long, subtended by a cluster of leaves forming an involucre, sepals 2–3 mm long, petals 3–5.5 mm long, reddish or purple; stamens 15 to many, filaments red. Fruit a circumscissile capsule, 3–4 mm in diameter; seeds 0.5–0.7 mm broad, slightly flattened, cochleate in outline, minutely tuberculate, black.

Plants of open sunny sites and often found on rocky sites or sand along streams from near sea level to 1,200 m elevation along the Pacific slope of Central America and in the Caribbean lowlands; flowering primarily from June to February. The species ranges from the southeastern United States, the West Indies, and Mexico through Central America to South America.

Portulaca pilosa is characterized by its small succulent stems with unusual fimbriate intrapetiolar stipules that give a tufted white-hairy appearance to the stems. The distal rose red flowers subtended by similar tufted hairs and by a cluster of leaves are also distinctive. The species has only been collected in the seasonally very dry areas of the northern Pacific slope in Costa Rica, during the wet season.

***Portulaca umbraticola* H.B.K., Nov. Gen. & Sp. 6:72. 1823. *P. lanceolata* Engelm., Boston J. Nat. Hist. 6:154. 1850, non Haw. 1803. *P. coronata* Small, Bull. Torrey Bot. Club 23:126. 1896. *P. plano-operculata* Kuntze, Rev. Gen. 3:16. 1898. *P. denudata* Poellin., Repert. Spec. Nov. Regni Veg. 33:159. 1933.**

Herbs, 10–50 cm tall, annual, stems prostrate to erect and simple or with open branching, stems glabrous and green to magenta, roots fibrous; stipules absent or represented by short (1 mm) whitish hairs at the axils. Leaves alternate along the stems and in whorls of 3–8 beneath the flowers, subsessile or with short (1–2 mm) petioles; laminae 1–3 (5) cm long, 0.4–1.1 (1.6) cm broad, lower laminae spatulate to obovate, the upper oblanceolate to oblong, usually rounded at the apex, tapering gradually to the base, glabrous, succulent, venation obscure. Flowers in terminal clusters, bracteoles 1.5–2 mm long, lanceolate to deltoid; sepals 2, 3–5 (8) mm long, ovate, petals to 1 cm long, yellow to orange or red, spatulate or obovate; stamens 7–27, anthers narrow; ovary with an adnate corona, style 5–8 mm long, stigmatic branches 3–8. Fruit a capsule subtended by the persisting leaves and calyx, 3–5 mm long, usually turbinate, sessile or borne on a pedicel to 4 mm long, circumscissile at the middle or above, the operculum rounded, 3–4 mm broad and 1–2 mm high, the coronal wing 0.5–1 mm wide, arising just below the line of dehiscence; seeds 0.7–1 mm broad, gray, cochleate and tuberculate.

Plants of open sunny sites in seasonally dry areas, ranging from near sea level to 1,200 m in our area, but rarely collected below 600 m in central Central America. Flowering material has been collected from June to September in Central America, along the Pacific slope, and in the Central Highlands. The species ranges from the southern United States (Arizona to Georgia), Mexico, and the West Indies through Central America to South America.

Portulaca umbraticola is recognized by its succulent and glabrous stems and

leaves (hairs only at the leaf axils), the terminal flowers subtended by a whorl of leaves, fruit opening by the circumscissile dehiscence of a slightly domed (curved) lid or operculum, and the restriction to seasonally very dry vegetation. This species has only recently been collected in Costa Rica at the Santa Rosa National Park in Guanacaste province (*Liesner & Lockwood 2687*). While common in Honduras between 600 and 1,100 m elevation, we have not seen specimens from Guatemala. In Honduras the species is called *Verdolaga*.

TALINUM Adanson

Herbs or subshrubs, annual or perennial, bisexual, stems often succulent, usually glabrous; stipules absent. Leaves alternate or subopposite, simple and entire, usually quite succulent. Inflorescences often cymose, the cymes arranged in compound panicles or simple and few flowered, flowers rarely solitary and axillary, usually pedicellate; flowers bisexual, radially symmetrical, sepals 2, opposite and free, usually early deciduous, petals 5 or more, free or connate at the base, deciduous; stamens 5 to many, sometimes united into antipetalous fascicles, filaments slender; pistil 1, ovary superior, 1- or 3-locular near the base, placentation basal or free central, styles 3, united near the base. Fruit a capsule, 1- or 3-locular near the base, opening from the top into 3 valves or irregularly; seeds somewhat flattened, cochleate to reniform in outline.

A genus of probably fewer than 50 species, two of which are found in Central America. The genus ranges from temperate and tropical America to Africa and Asia.

- 1a Plants with succulent stems that do not persist through the dry season; larger leaves 3–6 cm broad; inflorescence a much-branched panicle with many distant flowers; sepals 3–4 mm long; uncommon plants of the seasonally dry Pacific slope from Mexico to Costa Rica *T. paniculatum*
 1b Plants with woody stems that persist through the dry season and are perennial; larger leaves rarely exceeding 2.5 cm in breadth; inflorescence a few-branched cyme or raceme; sepals 5–6 mm long; ranging from Mexico to central Nicaragua and not included in the descriptions: *T. triangulare* (Jacq.) Willd. (See note below.)

Talinum paniculatum (Jacq.) Gaertner, *Fruct. & Sem.* 2:219, pl. 128, f. 13. 1791. *Portulaca paniculata* Jacquin, *Enum. Pl. Carib.* 22. 1760. *P. patens* L., *Mant. Pl.* 242. 1771. *T. patens* (L.) Willd., *Sp. Pl.* 2:863. 1800. *Claytonia paniculata* (Jacq.) O. Ktze., *Rev. Gen.* 1:57. 1891. Figure 40.

Herbs, erect to 1 m tall, stems succulent and simple or with a few lateral branches, from a tuberous base, glabrous, leafy internodes 0.5–10 cm long, 1–6 mm thick; stipules absent. Leaves alternate, glabrous, petioles 1–15 mm long and not clearly differentiated from the lamina, with lateral wings continuous with the lamina margins; laminae 2–13 cm long, 1–6 cm broad, elliptic to obovate, abruptly obtuse or rounded at the apex, tapering gradually to the cuneate base and decurrent on the petiole, margins entire, succulent in life but drying brittle (chartaceous to subcoriaceous) and dark, the 2–4 pairs of major secondary veins often obscure. Inflorescences 10–60 cm long, 6–20 cm broad, terminal, paniculate with a central stem and slender alternate branches, flowers in open cymes on very slender (0.2 mm, dry) pedicels 1–2 cm long; flowers 3–4 mm long, perianth of 2 whorls and not persisting in fruit, sepals ca. 2 mm long, petals ca. 3 mm long, yellow or pink; stamens 15 or more, filaments 1.2–2 mm long, anthers 0.3–0.5 mm long; ovary globose, 1 mm long. Fruit a lustrous yellowish globose capsule 3.5–5 mm in diameter, breaking open irregularly; seeds slightly flattened, cochleate in outline, 1–1.5 mm broad, surface black and lustrous, minutely reticulate, strophiolate.

Plants of open weedy sites, riverbanks, and thickets from (0) 100 to 1,200 m elevation along the seasonally very dry Pacific slope of Central America; growing and flowering in the wet season, from June to December. The species ranges